In The Claims

1. (Currently amended) A method for measuring an electrical characteristic on a molecular scale, said method comprising the steps of:

probing a molecular layer using atomic force microscopy (AFM) having a cantilever including a large contact area probe tip by controlling the force applied to said probe tip, said probe tip having a radius greater than 100 nm; and

detecting, in response to said probing, an electrical characteristic of said molecular layer.

2. (Currently amendd) The method of claim 1, wherein the large contact area probe tip comprises a large radius sphere having a radius greater than 100 nm affixed to the cantilever.

3. (Previously presented) The method of claim 1, wherein the step of probing includes varying the force applied to said probe tip.

4. (Previously presented) The method of claim 1, wherein said electrical characteristic is at least one selected from the group consisting of: current, voltage, capacitance, conductance, resistance, and impedance.

5. (Previously presented) The method of claim 1, wherein the step of detecting includes coupling said molecular layer, said cantilever, and a meter to each other in a circuit.

6. (Previously presented) The method of claim 1, wherein the molecular layer is at least one selected from the group consisting of: a self-assembled monolayer, a thin insulator layer deposited on a substrate, a self-assembled multilayer, a Langmuir-Blodgett film, and a supramolecular structure.

7. (Previously presented) The method of claim 1, wherein said molecular layer is assembled by at least one technique selected from the group consisting of: ion beam sputtering, ion beam deposition, evaporation, sputtering, physical vapor deposition, chemical vapor deposition, and electrodeposition.

8. (Currently amended) A system for measuring an electrical characteristic on a molecular scale, said system comprising:

a molecular layer, subject to having said electrical characteristic thereof measured;

an atomic force microscope (AFM) including a cantilever having a large contact area probe tip for probing said molecular layer, said probe tip having a radius greater than 100 nm; and

a meter coupled to said molecular layer and said cantilever for detecting said electrical characteristic of said molecular layer in response to said probing of said molecular layer.

9. (Currently amended) The system of claim 8, wherein said large contact area probe tip comprises a large radius sphere having a radius greater than 100 nm attached to the cantilever.

10. (Original) The system of claim 8, wherein said cantilever and said large contact area probe tip comprise at least an electrically conductive coating, the cantilever and large contact area probe tip are electrically conductive.

11. (Original) The system of claim 8, wherein said molecular layer is probed by controlling the force applied to the probe tip.

12. (Original) The system of claim 11, wherein said force applied to said probe tip is varied.

13. (Original) The system of claim 8, wherein the detected electrical characteristic is at least one selected from the group consisting of: voltage, current, capacitance, conductance, resistance, and impedance.

14. (Original) The system of claim 8, wherein the molecular layer is at least one selected from the group consisting of: self assembled monolayer, a supramolecular structure, a self-assembled multilayer, a Langmuir-Blodgett film, and a thin insulator deposited on a substrate.

15. (Original) The system of claim 8, wherein the molecular layer is assembled by at least one technique selected from the group consisting of: fluid self-assembly, vapor phase self-assembly, vapor deposition, Langmuir-Blodgett deposition, and reactive self-assembly.

16. (New) The method of claim 1, wherein the large contact area probe tip has a radius greater than 1000 nm.

17. (New) The system of claim 8, wherein the large contact area probe tip has a radius greater than 1000 nm.